

WEST Search History

DATE: Wednesday, June 18, 2003

08/8551799

Set Name Query
side by side

Hit Count Set Name
result set

DB=USPT,PGPB,JPAB,EPAB,DWPI; PLUR=YES; OP=ADJ

L52	L51 AND L8	47	L52
L51	SOAP	77406	L51
L50	L49 AND L8	11	L50
L49	SHOWER ADJ GEL	1314	L49
L48	L47 AND L8	0	L48
L47	CLEANSING ADJ TISSUE	151	L47
L46	RAZOR ADJ BLADE ADJ LUBRICATION ADJ STRIP	1	L46
L45	L44 AND L8	0	L45
L44	HAIR ADJ DETANGLER	11	L44
L43	L42 AND L8	0	L43
L42	HAIR ADJ GROOMING\$	501	L42
L41	L40 AND L8	1	L41
L40	DENTURE ADJ ADHESIVE	435	L40
L39	SPERMICIDE ADSJ GEL	0	L39
L38	L37 AND L8	0	L38
L37	LUBRICATING ADJ GEL	109	L37
L36	L35 AND L8	0	L36
L35	BEAUTY ADJ AID	284	L35
L34	L33 AND L8	10	L34
L33	(ANTIPERSPIRANT OR DEODORANT)	22913	L33
L32	SHAVING\$ AND L8	4	L32
L31	L30 AND L8	0	L31
L30	SHAVING ADJ PRODUCT	234	L30
L29	L27 AND L8	1	L29
L28	L27 SAME L8	0	L28
L27	mouth ADJ WASH	2493	L27
L26	hair near antifrizz\$	1	L26
L25	hair same antifrizz\$	1	L25
L24	L23 same l8	0	L24
L23	hair adj relaxer	153	L23
L22	L8 and l20	2	L22
L21	L20 same l8	0	L21
L20	dyeing adj compositions	2111	L20
L19	l8 and hair adj colorant	12	L19
L18	l8 and haor adj colorant	0	L18
L17	L16 and l8	4	L17
L16	hair adj bleach\$4	812	L16
L15	L8 and sunscreen\$	33	L15
L14	l8 and suncare	0	L14

L13	l8 and conditioner	43	L13
L12	L11 and l8	56	L12
L11	shampoo	23846	L11
L10	L9 and l8	10	L10
L9	hair adj styling adj gel	154	L9
L8	(hydrophobically same modified same hydroxyethylcellulose)	227	L8
L7	(3-alkoxy-2-hydroxy adj propyl adj hydroxy adj ethyl adj cellulose)	0	L7
L6	(3 adj alkoxy adj 2 adj hydroxy adj propyl adj hydroxy adj ethyl adj cellulose)	0	L6
L5	L2 and hair	6	L5
L4	L3 and l2	0	L4
L3	personal adj care adj compositions	809	L3
L2	mixed adj hydrophobic adj polymers	54	L2
L1	mixed adj hydrophobe adj polymers	2	L1

END OF SEARCH HISTORY

WEST

Generate Collection

L13: Entry 38 of 43

File: USPT

Jun 9, 1992

DOCUMENT-IDENTIFIER: US 5120531 A

** See image for Certificate of Correction **

TITLE: Hair styling conditionersAbstract Text (1):

The present invention relates to rinse off hair conditioner compositions comprising from about 0.2% to about 20% of certain hair styling polymers, from about 0.2% to about 20% of certain non-aqueous solvents for said hair styling polymers, and from about 0.05% to about 25% of a hair conditioning agent, in an aqueous base, wherein the polymer and solvent are present in the composition as a dispersed fluid phase.

Brief Summary Text (2):

The present invention relates to rinse off hair conditioner compositions which provide not only hair conditioning benefits, but also hair styling benefits. These are achieved by incorporating certain hair styling polymers and solvents for said polymers in a conditioner base.

Brief Summary Text (6):

It has now been discovered that two separate hair care benefits, i.e., conditioning and styling benefits, can be provided by a single hair care product. The present invention relates to rinse off hair conditioner compositions which comprise conditioners and certain hair styling agents. Rinsing with these products after shampooing provides hair conditioning and styling benefits.

Brief Summary Text (14):

The present invention relates to rinse off hair conditioner compositions comprising:

Brief Summary Text (22):

wherein the polymer and solvent are present in the hair conditioner as a dispersed fluid phase; and wherein the ratio of polymer to solvent is from about 10:90 to about 80:20.

Detailed Description Text (4):

The conditioner compositions of the present invention contain, as an essential component, certain hair styling polymers. It is this component that provides hair styling benefits to the user.

Detailed Description Text (7):

It has now been found that styling polymers having water-solubilities within a certain range provide optimum hair styling benefits when delivered from a hair conditioner. The styling polymers of the present invention are of relatively low water-solubility. More specifically, these polymers have a solubility parameter, Δ , of between about 8.5 and about 12.0 (units equal $(\text{cal}/\text{cm}^3)^{1/2}$), preferably from about 9.5 to about 11.5, most preferably from about 11 to about 11.5.

Detailed Description Text (9):

It has been found that styling polymers having water solubilities within this range can be dispersed with the polymer solvent, as described infra, in conditioner compositions as a dispersed fluid phase. Formulation in this way has been shown to provide maximum deposition of styling polymer out of the conditioner composition and onto hair. Styling polymers having solubility parameters at the upper end of this range would be soluble by themselves in the present conditioner compositions. It has now been found that when these polymers are combined with the polymer solvents of the present invention (as defined infra) and then dispersed in the conditioner composition, they remain in the composition as a dispersed fluid phase. Polymers having solubility parameters greater than about 12.0 will be soluble in the conditioner composition (even when they are premixed with the present polymer solvents) preventing optimum deposition of polymer on hair. Styling polymers having solubility parameters lower than about 8.5 are difficult to remove from hair and tend to build up on hair with repeated application.

Detailed Description Text (14):

Specific styling polymers of the present invention which provide the desired deposition/styling benefits out of a conditioner system are as follows: vinyl pyrrolidone/vinyl acetate copolymers (at ratios of up to about 30%, by weight, vinyl pyrrolidone); vinyl acetate homopolymer; t-butyl acrylate homopolymer; t-butyl styrene/ethyl hexyl methacrylate copolymer (50/50, by weight); dimethyl acrylamide/t-butyl acrylate/ethyl hexyl methacrylate copolymer (10/45/45); ethylene/vinyl acetate copolymer (12.5/87.5); allyl alcohol/styrene copolymer (19/81); vinyl chloride/vinyl acetate copolymer (83/17 and lower); vinyl pyrrolidone/vinyl acetate/butyl acrylate copolymer (10/78/12 and 10/70/20); vinyl pyrrolidone/vinyl acetate/butyl acrylate/styrene sulfonate copolymer (10/70/15/5); vinyl pyrrolidone/vinyl propionate copolymer (5/95); vinyl caprolactam/vinyl acetate copolymer (5/95); and styling resins sold under the trade names Ultrahold 8 by Ciba Geigy (ethyl acrylate/acrylic acid/N-t-butyl acrylamide copolymer), Resyn 28-1310.RTM. by National Starch and Luviset CA 66.RTM. by BASF (vinyl acetate/crotonic acid copolymer 90/10); Luviset CAP.RTM. by BASF (vinyl acetate/vinyl propionate/crotonic acid 50/40/10); and Resyn 28-2930.RTM. by National Starch (vinyl acetate/vinyl neodecanoate/crotonic acid copolymer). The most preferred copolymers for use in the present invention are copolymers of vinyl pyrrolidone and vinyl acetate containing at most 30% vinyl pyrrolidone.

Detailed Description Text (16):

The styling polymers of the present invention formulated in the present conditioner compositions provide hair styling benefits. Such benefits include ease of style achievement and style maintenance. The present compositions also provide some degree of restyling benefits. That is, after the hair is rinsed with the present compositions and styled, the hair "remembers" the style after being subjected to a force, such as combing, brushing or simply flattening of the hair.

Detailed Description Text (18):

A second essential component of the present conditioner compositions is a non-aqueous solvent or diluent for the styling polymer. The solvent is necessary for dilution of the polymer so that it can be dispersed in the conditioner composition. The present solvents provide optimum deposition of polymer onto hair. The solvent also aids in delivering style achievement by making polymer deposited on the hair more tacky through the hair drying and styling process. Hence, the polymer remains adhered to the hair and it enables easy manipulation of the hair into the desired style. The particular polymer chosen for use in the present conditioner compositions must be soluble in the particular solvent utilized. This enables the dispersion of the polymer/solvent mixture as a dispersed fluid phase in the conditioner composition and maintenance of that dispersed second phase. Hence, the polymer solvents of the present invention have a solubility in water at 25.degree. C. of greater than 0.2%, preferably greater than about 0.5%, and as high as 100% soluble in water, but preferably less than 10% soluble in water. Some solvents which are completely water soluble will not remain as a dispersed fluid phase with the polymer in the conditioner composition. They will instead enter the aqueous conditioner base phase and destroy the dispersed phase of polymer and solvent in the conditioner. Many of the solvent materials of the present invention, if dispersed in the conditioner base alone, would be soluble. However, it has been found that when the solvents of the present invention are premixed with certain polymers of the present invention, prior to dispersion in the conditioner composition, they will remain in the polymer phase, i.e., unsolubilized in the conditioner base.

Detailed Description Text (23):

The amount of solvent to be used in the present conditioner compositions is an amount sufficient to solubilize the polymer and disperse it as a separate fluid phase in the conditioner composition. Generally, from about 0.2% to about 20%, preferably from about 2% to about 6%, polymer solvent is used. At levels below about 0.2% solvent, the polymer cannot be sufficiently diluted; at levels above about 20% solvent, conditioner benefits may be negatively affected. The ratio of polymer to solvent in the present compositions is from about 10:90 to about 80:20, preferably from about 40:60 to about 60:40.

Detailed Description Text (24):

European Patent Publications 0320218, published Jun. 14, 1989, and 0323715, published Jul. 12, 1989, disclose certain hair styling polymers and solvents therefor, useful in hair care compositions, including shampoos and rinse-off hair conditioners. EPO Patent Publication 0323715 teaches polymer and solvent systems having very low water

solubilities (polymer is less than 0.1% soluble in water, diluent is less than 0.2% soluble in water) which are dispersed as a separate fluid phase in hair care compositions.

Detailed Description Text (26):

The conditioner compositions of the present invention comprise, in addition to the styling polymer and solvent therefor, a conditioning agent. The conditioning agent is present in the compositions of the present invention at a level of from about 0.05% to about 25%, preferably from about 2% to about 10%. These conditioning agents may comprise conditioning agents typically used in hair conditioner compositions. Such agents generally comprise a lipid material and a cationic surfactant. These agents together provide not only hair conditioning benefits, such as anti-static, soft hair feel, and ease of combing, but also provide a gel-network thickened vehicle for the styling polymer and solvent of the present compositions. Gel-type vehicles are generally described in the following documents, all incorporated by reference herein: Barry, "The Self Bodying Action of the Mixed Emulsifier Sodium Dodecyl Sulfate/Cetyl Alcohol", 28 J. of Colloid and Interface Science 82-91 (1968); Barry, et al., "The Self-Bodying Action of Alkyltrimethylammonium Bromides/Cetostearyl Alcohol Mixed Emulsifiers; Influence of Quaternary Chain Length", 35 J. of Colloid and Interface Science 689-708 (1971); and Barry, et al., "Rheology of Systems Containing Cetomacrogol 1000--Cetostearyl Alcohol, I. Self Bodying Action", 38 J. of Colloid and Interface Science 616-625 (1972).

Detailed Description Text (30):

Cationic surfactants useful in the present conditioner compositions, contain amino or quaternary ammonium hydrophilic moieties which are positively charged when dissolved in the aqueous composition of the present invention. Cationic surfactants among those useful herein are disclosed in the following documents, all incorporated by reference herein: McCutcheon's, Emulsifiers & Detergents, (1989, published by the M. C. Publishing Company) Schwartz, et al., Surface Active Agents, Their Chemistry and Technology, New York: Interscience Publishers, 1949; U.S. Pat. No. 3,155,591, Hilfer, issued Nov. 3, 1964; U.S. Pat. No. 3,929,678, Laughlin, et al., issued Dec. 30, 1975; U.S. Pat. No. 3,959,461, Bailey, et al., issued May 25, 1976; and U.S. Pat. No. 4,387,090, Bolich, Jr., issued Jun. 7, 1983. If included in the compositions of the present invention, the cationic surfactant is present at from about 0.05% to about 5%.

Detailed Description Text (36):

Alternative hair conditioning agents that can be used in addition to or instead of the cationic surfactants described above are protein derivatives, such as hydrolyzed animal proteins. For example, Crotein SPA (Croda) or Lexeine X250 (Inolex) or Polypeptide LSN (Stephan) can be utilized in the present conditioner compositions. Such agents are generally present at a level of from about 0.05% to about 5.0%.

Detailed Description Text (37):

Other hair conditioning agents which can be used in addition to or instead of the above-described cationic surfactant plus lipid material are siloxane or siloxane-containing materials which are present at a level of from about 0.01% to about 10% of the conditioner composition, preferably from about 0.1% to about 5%, most preferably from about 0.2% to about 3%.

Detailed Description Text (38):

Siloxanes (see, for example, U.S. Pat. No. 3,208,911, Oppliger, issued Sep. 28, 1965) and siloxane-containing polymers have been taught for use in hair conditioning compositions. U.S. Pat. No. 4,601,902, Fridd et al., issued Jul. 22, 1986, describes hair conditioning or shampoo/conditioner compositions which include a polydiorganosiloxane having quaternary ammonium substituted groups attached to the silicon, and a polydiorgano-siloxane having silicon-bonded substituents which are amino-substituted hydrocarbon groups. U.S. Pat. No. 4,654,161, Kollmeier et al., issued Mar. 31, 1987, describes a group of organopoly-siloxanes containing betaine substituents. When used in hair care compositions, these compounds are said to provide good conditioning, compatibility with anionic components, hair substantivity, and low skin irritation. U.S. Pat. No. 4,563,347, Starch, issued Jan. 7, 1986, relates to hair conditioning compositions which include siloxane components containing substituents to provide attachment to hair. Japanese Published Application 56-129,300, Lion Corporation, published Oct. 9, 1981, relates to shampoo conditioner compositions which include an organopolysiloxane-oxyalkylene copolymer together with an acrylic resin. U.S. Pat. No. 4,479,893, Hirota et al., issued Oct. 30, 1984, describes shampoo conditioner compositions containing a phosphate ester surfactant and a silicon derivative (e.g., polyether- or alcohol-modified siloxanes). Polyether-modified

polysiloxanes are also disclosed for use in shampoos in U.S. Pat. No. 3,957,970, Korkis, issued May 18, 1976. U.S. Pat. No. 4,185,087, Morlino, issued Jan. 22, 1980, describes quaternary nitrogen derivatives of trialkylamino hydroxy organosilicon compounds which are said to have superior hair conditioning properties.

Detailed Description Text (39):

Siloxane-derived materials have also been used in hair styling compositions. Japanese Published Application 56-092,811, Lion Corporation, published Dec. 27, 1979, describes hair setting compositions which comprise an amphoteric acrylic resin, a polyoxyalkylene-denatured organopolysiloxane, and polyethylene glycol. U.S. Pat. No. 4,744,978, Homan et al., issued May 17, 1988, describes hair styling compositions (such as hair sprays) which include the combination of a carboxyfunctional polydimethyl-siloxane and a cationic organic polymer containing amine or ammonium groups. Hair styling compositions which include poly-diorganosiloxanes and a cationic organic polymer are taught in U.S. Pat. No. 4,733,677, Gee et al., issued Mar. 29, 1988, and U.S. Pat. No. 4,724,851, Cornwall et al., issued Feb. 16, 1988. Finally, European Patent Application 117,360, Cantrell et al., published Sep. 5, 1984, discloses compositions, containing a siloxane polymer having at least one nitrogen-hydrogen bond, a surfactant, and a solubilized titanate, zirconate or germanate, which act as both a conditioner and a hair styling aid.

Detailed Description Text (83):

As with the non-siloxane containing styling polymers described supra, the present copolymers must be diluted with a polymer solvent of the present invention prior to combination with the remaining conditioner composition ingredients. This will enable the formation of a dispersed phase of polymer and solvent in the conditioner composition.

Detailed Description Text (84):

When these siloxane containing copolymers are used in the conditioner compositions of the present invention to act as both a hair styling polymer and hair conditioning agent, they are generally present at a level of from about 0.2% to about 20%, preferably from about 2% to about 6%.

Detailed Description Text (86):

The present silicone conditioning agents can be used in conditioner vehicle systems thickened with materials other than the lipid material plus cationic surfactant gel-network vehicle systems described supra.

Detailed Description Text (89):

Alternative water-soluble polymeric thickeners sometimes used to thicken conditioner compositions are natural polysaccharides such as guar gum, xanthan gum and locust bean gum.

Detailed Description Text (90):

A number of references teach the use of nonionic cellulose ethers and water-soluble gums for thickening hair care compositions. See for example, U.S. Pat. No. 4,557,928, Glover, issued Dec. 10, 1985, teaching a hair conditioner comprising a suspension system which consists of one of glucan gum, guar gum, and hydroxyethylcellulose; and U.S. Pat. No. 4,581,230, Grollier et al., issued Apr. 8, 1986, which teaches cosmetic compositions for treating hair which comprise as thickening agents hydroxyethylcellulose, or water-soluble vegetable thickening agents, such as guar gum. Japanese Patent Publication 61-053211, published Mar. 7, 1986, discloses a hair colorant containing an aromatic alcohol, xanthan gum, and hydroxyethylcellulose.

Detailed Description Text (96):

One commercially available material which meets these requirements is NATROSOL PLUS Grade 430, hydrophobically modified hydroxyethylcellulose available from Aqualon Company, Wilmington, Delaware. This material has a C.sub.16 alkyl substitution of about 0.5% to about 0.9% by weight. The hydroxyethyl molar substitution for this material is from about 2.8 to about 3.2. The average molecular weight for the water-soluble cellulose prior to modification is approximately 300,000.

Detailed Description Text (99):

These materials can be used with certain secondary thickening materials to provide a rheology very much like the gel-network structure provided by lipid material plus cationic surfactant based conditioner compositions described supra.

Detailed Description Text (108):

The conditioner compositions of the present invention which are thickened with the hydrophobically-modified hydroxyethyl cellulose plus secondary thickening materials, as described above preferably also contain a material which provides additional rheological benefits to the cosmetic compositions formulated therewith. These materials are chelating agents. In general, such materials include monodentate and multidentate agents. Specific examples of useful chelating agents include ethylene-diaminetetraacetic acid (EDTA), and salts thereof, nitrilotriacetic acid (NTA) and salts thereof, hydroxyethyl ethylene diamine triacetic acid (HEEDTA) and salts thereof, diethylene triamine pentaacetic acid (DTPA) and salts thereof, diethanolglycine (DEG) and salts thereof, ethanol diglycine (EDG) and salts thereof, citric acid and salts thereof, phosphoric acid and salts. The most preferred of these is EDTA. The chelating agents tend to make the vehicle systems useful in the present invention smoother and less gelatinous in consistency.

Detailed Description Text (110):

An additional component which may be used in the conditioner compositions of the present invention which are thickener with the hydrophobically modified hydroxyethyl cellulose plus secondary thickening materials, as described above, is a material which acts as a distributing aid for the composition. Such a material helps to distribute the composition onto the hair avoiding localized deposition of the conditioning and styling components onto the hair. Without such a component in a composition, some components in the composition would not be deposited and spread out as evenly, and hence, would not be quite as effective.

Detailed Description Text (116):

The hair conditioner compositions herein can contain a variety of other optional components suitable for rendering such compositions more cosmetically or aesthetically acceptable or to provide them with additional usage benefits. Such conventional optional ingredients are well-known to those skilled in the art, e.g., pearlescent aids, such as TiO₂ coated mica, ethylene glycol distearate, and PEG 3 distearate; opacifiers; preservatives, such as benzyl alcohol, Glydant, Kathon, methyl paraben, propyl paraben and imidazolidinyl urea; fatty alcohols, such as cetearyl alcohol; sodium chloride; sodium sulfate; polyvinyl alcohol; ethyl alcohol; pH adjusting agents, such as citric acid, sodium citrate, succinic acid, phosphoric acid, monosodium phosphate, disodium phosphate, sodium hydroxide, and sodium carbonate; coloring agents, such as any of the FD&C or D&C dyes; perfumes; sequestering agents, such as disodium ethylenediamine tetra-acetate; and polymer plasticizing agents, such as glycerin and propylene glycol. The present compositions can also optionally comprise thickeners and viscosity modifiers, such as a diethanolamide of a long chain fatty acid (e.g., PEG 3 lauric diethanolamide), lauramide DEA, cocomonethanol amide, dimethicone copolyols, guar gum, xanthan gum, methyl cellulose, hydroxyethyl cellulose, starches and starch derivatives. Such optional ingredients generally are used individually at levels of from about 0.01% to about 10.0%, preferably from about 0.05% to about 5.0%, of the conditioner composition.

Detailed Description Text (117):

As with all compositions, the present invention should not contain optional components which unduly interfere with the conditioning and hair style holding performance of the present conditioner compositions.

Detailed Description Text (119):

The balance of the present conditioner compositions comprises water or water combined with some other carrier substance which does not interfere with the conditioning and style hold benefits of the present compositions.

Detailed Description Text (121):

The hair conditioner compositions of the present invention can be made using conventional formulation and mixing techniques. The polymer must first be dissolved in the polymer solvent. The remaining ingredients are combined in a separate vessel and the polymer/solvent mixture is added. Methods of making various types of hair conditioner compositions are described in the following examples.

Detailed Description Text (123):

The hair conditioner compositions of the present invention are used in conventional ways to provide the hair conditioning and styling hold benefits of the present invention. Such method generally involves application of an effective amount of the conditioner product to wet shampooed hair, which is massaged through and then rinsed from the hair. By "effective amount" is meant an amount sufficient to provide the hair conditioning and style hold benefits desired considering the length and texture of the

hair. After the hair is treated with the compositions of the present invention, the hair is dried and styled in the usual ways of the user.

Detailed Description Text (127):

The following is a rinse-off hair conditioner composition representative of the present invention.

Detailed Description Text (129):

This conditioner product provides hair conditioning and hair style holding benefits.

Detailed Description Text (131):

The following is a rinse-off hair conditioner composition representative of the present invention.

Detailed Description Text (133):

This conditioner product provides hair conditioning and hair style holding benefits.

Detailed Description Text (135):

The following is a rinse-off hair conditioner composition representative of the present invention.

Detailed Description Text (137):

This conditioner product provides hair conditioning and hair style holding benefits.

Detailed Description Text (139):

The following is a rinse-off hair conditioner composition representative of the present invention.

Detailed Description Text (141):

This conditioner product provides hair conditioning as well as hair style hold benefits.

CLAIMS:

1. A rinse-off hair conditioner composition comprising:

a. from about 0.05% to about 25% of a hair conditioning agent;

b. from about 0.2% to about 20% of a hair styling polymer comprising:

A. from 0% to about 50% of a polymerizable hydrophilic monomer (M.sub.A), or mixtures thereof; and

B. from about 50% to about 100% of a polymerizable hydrophobic monomer (M.sub.B), or mixtures thereof;

said polymer having a weight average molecular weight of from about 5,000 to about 1,000,000, a Tg of greater than about -20.degree. C., and a solubility parameter, .delta., of from about 8.5 to about 12.0; and

c. from about 0.2% to about 20% of a non-aqueous solvent which will solubilize said polymer, said solvent having a boiling point of less than or equal to about 300.degree. C., and a solubility in water at 25.degree. C. of greater than 0.2%; and

d. the balance, an aqueous carrier;

wherein the polymer and solvent are present in the hair conditioner composition as a dispersed fluid phase; and wherein the ratio of polymer to solvent is from about 10:90 to about 80:20.

2. The hair conditioner composition of claim 1 wherein .delta. is from about 9.5 to about 11.5.

3. The hair conditioner composition of claim 2 wherein .delta. is from about 11 to about 11.5.

4. The hair conditioner composition of claim 3 wherein the hydrophobic monomer is selected from the group consisting of acrylic acid esters of C.sub.1 -C.sub.18 alcohols; methacrylic acid esters of C.sub.1 -C.sub.18 alcohols; styrene; polystyrene

macromer; vinyl acetate; vinyl chloride; vinylidene chloride; vinyl propionate; alpha-methylstyrene; t-butylstyrene; butadiene; cyclohexadiene; ethylene; propylene; vinyl toluene; methoxyethyl methacrylate; and mixtures thereof.

5. The hair conditioner composition of claim 3 wherein the hair styling polymer comprises both the polymerizable hydrophilic monomer and the polymerizable hydrophobic monomer.

6. The hair conditioner composition of claim 5 wherein the hydrophilic monomer is selected from the group consisting of acrylic acid, methacrylic acid, N,N-dimethylacrylamide, dimethylaminoethyl methacrylate, methacrylamide, N-t-butyl acrylamide, maleic acid, maleic anhydride, half esters of maleic anhydride, crotonic acid, itaconic acid, acrylamide, acrylate alcohols, hydroxyethyl methacrylate, vinyl pyrrolidone, vinyl ethers, maleimides, vinyl pyridine, vinyl imidazole, styrene sulfonate, allyl alcohol, vinyl alcohol, vinyl caprolactam, and mixtures thereof.

7. The hair conditioner composition of claim 6 wherein the hydrophobic monomer is selected from the group consisting of acrylic acid esters of C.sub.1 -C.sub.18 alcohols; methacrylic acid esters of C.sub.1 -C.sub.18 alcohols; styrene; polystyrene macromer; vinyl acetate; vinyl chloride; vinylidene chloride; vinyl propionate; alphamethylstyrene; t-butylstyrene; butadiene; cyclohexadiene; ethylene; propylene; vinyl toluene; methoxy ethyl methacrylate; and mixtures thereof.

8. The hair conditioner composition of claim 1 wherein the hair styling polymer is selected from the group consisting of vinyl pyrrolidone/vinyl acetate copolymer; t-butyl acrylate homopolymer; t-butyl styrene/ethyl hexyl methacrylate copolymer (50/50); dimethyl acrylamide/t-butyl acrylate/ethyl hexyl methacrylate copolymer (10/45/45); ethylene/vinyl acetate copolymer (12.5/ 87.5); styrene/allyl alcohol copolymer (81/19); vinyl chloride/ vinyl acetate copolymer (83/17 and lower); vinyl pyrrolidone/vinyl acetate/butyl acrylate copolymer (10/78/12 and 10/70/20); vinyl pyrrolidone/vinyl acetate/butyl acrylate/styrene sulfonate copolymer (10/70/17/5); vinyl pyrrolidone/vinyl propionate copolymer (5/95); vinyl caprolactam/vinyl acetate copolymer (5/95); ethyl acrylate/acrylic acid/N-t-butyl acrylamide copolymer; vinyl acetate/crotonic acid copolymer 90/10; vinyl acetate/vinyl propionate/crotonic acid 50/40/10; vinyl acetate/vinyl neodecanoate/ crotonic acid copolymer; and mixtures thereof.

9. The hair conditioner composition of claim 1 wherein the hair styling polymer is present in the composition at a level of from about 2% to about 6%.

10. The hair conditioner composition of claim 9 wherein the hair styling polymer is a vinyl pyrrolidone/vinyl acetate copolymer.

11. The hair conditioner composition of claim 1 wherein the solvent is soluble in water at 25.degree. C. at greater than about 0.5%.

12. The hair conditioner composition of claim 11 wherein the level of solvent is from about 2% to about 6%.

13. The hair conditioner composition of claim 12 wherein the solvent for the hair styling polymer is selected from the group consisting of iso-propanol, butyl alcohol, amyl alcohol, phenyl ethanol, benzyl alcohol, ethyl butyrate, iso-propyl butyrate, phenyl ethyl dimethyl carbinol, and mixtures thereof.

14. The hair conditioner composition of claim 13 wherein the ratio of polymer to solvent is from about 40:60 to about 60:40.

15. The hair conditioner composition of claim 10 wherein the solvent for the hair styling polymer is selected from the group consisting of benzyl alcohol, ethyl butyrate, phenyl ethanol, phenyl ethyl dimethyl carbinol, and mixtures thereof.

16. The hair conditioner composition of claim 1 wherein the hair conditioning agent comprises a cationic surfactant.

17. The hair conditioner composition of claim 16 wherein the hair conditioning agent comprises a quaternary ammonium-containing cationic surfactant material.

18. The hair conditioner composition of claim 17 wherein the hair conditioning agent comprises a dialkyl dimethyl ammonium chloride.

19. The hair conditioner composition of claim 18 wherein the hair conditioning agent comprises a dialkyl dimethyl ammonium chloride selected from the group consisting of ditallowdimethyl ammonium chloride, dicetyl dimethyl ammonium chloride, stearyl dimethyl benzyl ammonium chloride, cetyl trimethyl ammonium chloride and mixtures thereof.
20. The hair conditioner composition of claim 16 wherein the hair conditioning agent is selected from the group consisting of stearylamine hydrochloride, soyamine chloride, stearylamine formate, N-tallowpropane diamine dichloride, stearamidopropyl dimethyl amine citrate, and mixtures thereof.
21. The hair conditioner composition of claim 16 wherein the hair conditioning agent additionally comprises a lipid material.
22. The hair conditioner composition of claim 21 wherein the lipid material is selected from the group consisting of cetyl alcohol, stearyl alcohol, cetyl palmitate, glyceryl monostearate, and mixtures thereof.
23. The hair conditioner composition of claim 1 wherein the hair conditioning agent comprises a silicone conditioning agent, which is present in the conditioner composition as a separate dispersed phase.
24. The hair conditioner composition of claim 23 wherein the silicone conditioning agent is present at a level of from about 0.01% to about 10%.
25. The hair conditioner composition of claim 24 wherein the silicone conditioning agent is present at a level of from about 0.1% to about 5% and comprises a polydimethyl siloxane gum having a viscosity at 25.degree. C. greater than about 1,000,000 centipoise, and a dimethicone fluid having a viscosity at 25.degree. C. of from about 2 centipoise to about 100,000 centipoise, wherein the ratio of gum to fluid is from about 30:70 to about 70:30.
26. The hair conditioner composition of claim 23 wherein the silicone conditioning agent comprises a siloxane macromer grafted to the hair styling polymer.
27. The hair conditioner composition of claim 7 wherein the conditioning agent comprises a siloxane macromer grafted to the hair styling polymer.
28. The hair conditioner composition of claim 27 wherein the hair styling polymer is selected from the group consisting of vinyl pyrrolidone/polydimethyl siloxane/vinyl acetate copolymers.
29. The hair conditioner composition of claim 28 wherein the hair styling polymer comprises a vinyl pyrrolidone/polydimethyl siloxane/vinyl acetate copolymer (5/5/90).
30. The hair conditioner composition of claim 24 which additionally comprises from about 0.3% to about 5.0% of a nonionic cellulose ether having a hydroxyethyl molar substitution of from about 2.3 to about 3.3, and being further substituted with a C.sub.16 alkyl group at from about 0.50% to about 0.95%, by weight; and from about 0.3% to about 5.0% of a water-soluble polymeric material which is selected from the group consisting of hydroxyethyl cellulose, hydroxypropyl cellulose, hydroxypropylmethyl cellulose, polyethylene glycol, polyacrylamide, polyacrylic acid, polyvinyl alcohol, polyvinyl pyrrolidone, dextran, carboxymethyl cellulose, acacia plant exudate, ghatti plant exudate, tragacanth plant exudate, sodium alginate, propylene glycol alginate, sodium carrageenan, guar gum, locust bean gum, xanthan gum and mixtures thereof.
31. The hair conditioner composition of claim 30 additionally comprising from about 0.05% to about 1.0% of a chelating agent selected from the group consisting of ethyl diamine tetracetic acid and salts thereof, nitrilo triacetic acid and salts thereof, hydroxyethylene diamine triacetic acid and salts thereof, diethylene triamine penta-acetic acid and salts thereof, diethanol glycine and salts thereof, ethanol diglycine and salts thereof, citric acid and salts thereof, and phosphoric acid and salts thereof.
32. The hair conditioner composition of claim 30 wherein from about 0.02% to about 2.5% of the water-soluble polymer is selected from the group consisting of water-soluble polymeric materials having a weight average molecular weight greater than about 1,000,000, and water-soluble polymeric materials having strong ionic character.

33. The hair conditioner composition of claim 32 wherein the water-soluble polymeric material having a weight average molecular weight greater than about 1,000,000, or strong ionic character, is selected from the group consisting of xanthan gum, dextran, carboxymethyl celluloses, plant exudates, seaweed extracts, hydroxyethyl celluloses, and mixtures thereof.

34. The hair conditioner composition of claim 24 which additionally comprises from about 0.1% to about 10.0% of a nonionic cellulose ether having a hydroxyethyl molar substitution of from about 2.2 to about 3.3, and being further substituted with a C.sub.16 alkyl group at from about 0.50% to about 0.95%, by weight; and from about 0.02% to about 0.3% of a water-soluble surfactant having a weight average molecular weight of less than about 20,000, which is selected from the group consisting of cetyl betaine, ammonium lauryl sulfate, ammonium laureth sulfate, cetyl trimethyl ammonium chloride, and mixtures thereof.

35. The hair conditioner composition of claim 34 additionally comprising from about 0.05% to about 1.0% of a chelating agent selected from the group consisting of ethylene diamine tetracetic acid and salts thereof, nitrilo triacetic acid and salts thereof, hydroxyethylene diamine triacetic acid and salts thereof, diethylene triamine penta-acetic acid and salts thereof, diethanol glycine and salts thereof, ethanol diglycine and salts thereof, citric acid and salts thereof, and phosphoric acid and salts thereof.

36. The hair conditioner composition of claim 34 additionally comprising from about 0.02% to about 2.5% of a distributing aid which is selected from the group consisting of water-soluble polymeric materials having a weight average molecular weight greater than about 1,000,000, and water-soluble polymeric materials having strong ionic character.

37. The hair conditioner composition of claim 36 wherein the distributing aid is selected from the group consisting of xanthan gum, dextran, carboxymethyl celluloses, plant exudates, seaweed extracts, hydroxyethyl celluloses, and mixtures thereof.

38. The hair conditioner composition of claim 24 which additionally comprises from about 0.1% to about 10.0% of a nonionic cellulose ether having a hydroxyethyl molar substitution of from about 2.3 to about 3.3, and being further substituted with a C.sub.16 alkyl group at from about 0.50% to about 0.95%, by weight; and from about 0.01% to about 10.0% of a water-insoluble surfactant having a weight average molecular weight of less than about 20,000, which is selected from the group consisting of stearamide DEA, cocoamide MEA, dimethyl stearamine oxide, glycerol stearate citrate, dihydrogenated tallow dimethyl ammonium chloride, Poloxamer 181, hydrogenated tallow dimethyl betaine, hydrogenated tallow amide DEA, and mixtures thereof.

39. The hair conditioner composition of claim 38 additionally comprising from about 0.05% to about 1.0% of a chelating agent selected from the group consisting of ethylene diamine tetracetic acid and salts thereof, nitrilo triacetic acid and salts thereof, hydroxyethylene diamine triacetic acid and salts thereof, diethylene triamine penta-acetic acid and salts thereof, diethanol glycine and salts thereof, ethanol diglycine and salts thereof, citric acid and salts thereof, and phosphoric acid and salts thereof.

40. The hair conditioner composition of claim 38 additionally comprising from about 0.02% to about 2.5% of a distributing aid which is selected from the group consisting of water-soluble polymeric materials having a weight average molecular weight greater than about 1,000,000, and water-soluble polymeric materials having strong ionic character.

41. The hair conditioner composition of claim 40 wherein the distributing aid is selected from the group consisting of xanthan gum, dextran, carboxymethyl celluloses, plant exudates, seaweed extracts, hydroxyethyl celluloses, and mixtures thereof.

42. A rinse-off hair conditioner composition comprising:

a. from about 0.2% to about 3% of a silicone conditioning agent which comprises a polydimethylsiloxane gum having a viscosity at 25.degree. C. greater than about 1,000,000 centipoise and a dimethicone fluid having a viscosity at 25.degree. C. of between about 2 centipoise and about 100,000 centipoise, wherein the ratio of gum to fluid is from about 40:60 to about 60:40;

b. from about 2% to about 6% of a hair styling polymer selected from polyvinyl pyrrolidone/vinyl acetate copolymers, having a weight average molecular weight of from about 10,000 to about 2000,000, a Tg of from about 20.degree. C. to about 60.degree. C., and a solubility parameter, Δ , of from about 11 to about 11.5;

c. from about 2% to about 6% of a non-aqueous solvent which will solubilize said polymer selected from the group consisting of benzyl alcohol, ethyl butyrate, phenyl ethanol, phenyl ethyl dimethyl carbinol, and mixtures thereof; and

d. the balance, an aqueous carrier;

wherein the polymer and solvent are present in the conditioner composition as a dispersed fluid phase and the ratio of polymer to solvent is from about 40:60 to about 60:40.

43. A rinse-off hair conditioner composition comprising:

a. from about 0.2% to about 3% of a silicone conditioning agent which comprises a polydimethylsiloxane gum having a viscosity at 25.degree. C. greater than about 1,000,000 centipoise and a dimethicone fluid having a viscosity at 25.degree. C. of between about 2 centipoise and about 100,000 centipoise, wherein the ratio of gum to fluid is from about 40:60 to about 60:40;

b. from about 2% to about 6% of a hair styling polymer selected from t-butyl acrylate homopolymers, having a weight average molecular weight of from about 10,000 to about 200,000, a Tg of from about 20.degree. C. to about 60.degree. C.;

c. from about 2% to about 6% of a non-aqueous solvent which will solublize said polymer selected from the group consisting of benzyl alcohol, ethyl butyrate, phenyl ethanol, phenyl ethyl dimethyl carbinol, and mixtures thereof; and

d. the balance, an aqueous carrier;

wherein the polymer and solvent are present in the conditioner composition as a dispersed fluid phase, and the ratio of polymer to solvent is from about 40:60 to about 60:40.

44. A rinse-off hair conditioner composition comprising:

a. from about 2% to about 6% of a hair styling and hair conditioning polymer which comprises a polyvinyl pyrrolidone/polydimethyl siloxane/vinyl acetate copolymer, wherein the nonsiloxane backbone of the copolymer has a weight average molecular weight of from about 10,000 to about 200,000, a Tg of from about 20.degree. C. to about 60.degree. C., and a solubility parameter, Δ , of from about 11.0 to about 11.5;

b. from about 2% to about 6% of a non-aqueous solvent which will solubilize said polymer selected from the group consisting of benzyl alcohol, ethyl butyrate, phenyl ethanol, phenyl ethyl dimethyl carbinol, and mixtures thereof; and

c. the balance, an aqueous carrier;

wherein the polymer and solvent are present in the conditioner composition as a dispersed fluid phase and the ratio of copolymer to solvent is from about 40:60 to about 60:40.

45. A method for providing conditioning and styling hold to hair, said method comprising rinsing the hair with the hair conditioner composition of claim 1.

46. A method for providing conditioning and styling hold to hair, said method comprising rinsing the hair with the hair conditioner composition of claim 42.

47. A method for providing conditioning and styling hold to hair, said method comprising rinsing the hair with the hair conditioner composition of claim 43.

48. A method for providing conditioning and styling hold to hair, said method comprising rinsing the hair with the hair conditioner composition of claim 44.

[Generate Collection](#)[Print](#)**Search Results - Record(s) 1 through 4 of 4 returned.**

☐ 1. 20020192173. 18 Jan 02. 19 Dec 02. Anhydrous treatment compositions for the delivery of reactive agents to amino-acid based substrates. Glenn, Robert Wayne JR., et al. 424/70.1; A61K007/06.

☐ 2. 20020155080. 05 Mar 01. 24 Oct 02. Delivery of reactive agents via multiple emulsions for use in shelf stable products. Glenn, Robert Wayne JR., et al. 424/70.5; A61K007/09.

☐ 3. 20020131945. 17 Jan 01. 19 Sep 02. Delivery of reactive agents via self emulsification for use in shelf-stable products. Glenn, Robert Wayne JR., et al. 424/70.2; A61K007/06 A61K007/09.

☐ 4. 20020131944. 17 Jan 01. 19 Sep 02. Delivery of reactive agents via bi-layer structures for use in shelf-stable products. Glenn, Robert Wayne JR., et al. 424/70.2; A61K007/06 A61K007/09.

[Generate Collection](#)[Print](#)

Term	Documents
(16 AND 8).USPT,PGPB,JPAB,EPAB,DWPI.	4
(L16 AND L8).USPT,PGPB,JPAB,EPAB,DWPI.	4

[Previous Page](#)[Next Page](#)

[Generate Collection](#)[Print](#)**Search Results - Record(s) 1 through 1 of 1 returned.**

- ☐ 1. 20030077240. 24 Oct 01. 24 Apr 03. Use of high-purity phenylsilsesquioxane liquids for the preparation of cosmetic and pharmaceutical compositions. LeGrow, Gary E., et al. 424/70.121; A61K007/06 A61K007/11.

[Generate Collection](#)[Print](#)

Term	Documents
HAIR	109409
HAIRS	13983
ANTIFRIZZ\$	0
ANTIFRIZZ	1
(ANTIFRIZZ\$ NEAR HAIR).USPT,PGPB,JPAB,EPAB,DWPI.	1
(HAIR NEAR ANTIFRIZZ\$).USPT,PGPB,JPAB,EPAB,DWPI.	1

[Previous Page](#)[Next Page](#)

[Generate Collection](#)[Print](#)**Search Results** - Record(s) 1 through 1 of 1 returned.

☐ 1. EP 878189 A2 AU 728825 B AU 9864865 A ZA 9804001 A JP 11005801 A CA 2237367 A CN 1203070 A BR 9801619 A SG 68671 A1 KR 98086959 A MX 9803749 A1. Personal care composition - comprises vehicle system comprising hydrophobically modified nonionic water soluble polysaccharide polymer and personal care ingredient(s). MODI, J J, et al. A61K000/00 A61K007/00 A61K007/02 A61K007/06 A61K007/13 A61K007/135 A61K007/16 A61K007/32 A61K007/40 A61K007/42 A61K007/48 A61K007/50 A61K031/00 A61K047/00 A61K047/36 A61L000/00 C08B011/00 C08B011/02 C08B037/00 C11D000/00.

[Generate Collection](#)[Print](#)

Term	Documents
RAZOR	16261
RAZORS	2002
BLADE	435870
BLADES	245815
LUBRICATION	80760
LUBRICATIONS	258
STRIP	617685
STRIPS	310049
(RAZOR ADJ BLADE ADJ LUBRICATION ADJ STRIP).USPT,PGPB,JPAB,EPAB,DWPI.	1
(RAZOR ADJ BLADE ADJ LUBRICATION ADJ STRIP).USPT,PGPB,JPAB,EPAB,DWPI.	1

[Previous Page](#)[Next Page](#)

WEST

Generate Collection

L12: Entry 52 of 56

File: USPT

Mar 31, 1992

DOCUMENT-IDENTIFIER: US 5100657 A

TITLE: Clean conditioning compositions for hair

Brief Summary Text (11):

These modified cellulose ethers have been disclosed for use in a variety of composition types. Landoll ('277) teaches the use of these materials in shampoo formulations. Hercules trade literature teaches the use of these materials in shampoos, liquid soaps, and lotions. U.S. Pat. No. 4,683,004, Goddard, issued July 28, 1987, discloses the use of these materials in mousse compositions for the hair. U.S. Pat. No. 4,485,089, Leipold, issued Nov. 27, 1984, teaches dentifrice compositions containing these materials.

Brief Summary Text (13):

Silicone materials have been used to provide hair conditioning as an alternative to, or in combination with other hair conditioning materials. Siloxanes (see, for example, U.S. Pat. No. 3,208,911, Opplinger, issued Sept. 28, 1965) and siloxane-containing polymers have been taught for use in hair conditioning compositions. U.S. Pat. No. 4,601,902, Fridd et al., issued July 22, 1986, describes hair conditioning or shampoo/conditioner compositions which include a polydiorganosiloxane having quaternary ammonium substituted groups attached to the silicone, and a polydiorganosiloxane having silicon bonded substituents which are amino-substituted hydrocarbon groups. U.S. Pat. No. 4,654,161, Kollmeier et al., issued Mar. 31, 1987, describes a group of organopolysiloxane containing betaine substituents. When used in hair care compositions these compounds are said to provide good conditioning, compatibility with anionic components, hair substantivity, and low skin irritation. U.S. Pat. No. 4,563,347, Starch, issued Jan. 7, 1986, relates to hair conditioning compositions which include siloxane components containing substituents to provide attachment to hair. Japanese Published Application 56-129,300, Lion Corporation, published Oct. 9, 1981, relates to shampoo/conditioner compositions which include an organopolysiloxane oxyalkylene copolymer together with an acrylic resin. U.S. Pat. No. 4,479,893, Hirota et al., issued Oct. 30, 1984, describes shampoo/conditioner compositions containing a phosphate ester surfactant and a silicon derivative (e.g., polyether- or alcohol-modified siloxanes). Polyether-modified polysiloxanes are also disclosed for use in shampoos in U.S. Pat. No. 3,957,970, Korkis, issued May 18, 1976. U.S. Pat. No. 4,185,087, Morlino, issued Jan. 22, 1980, describes quaternary derivatives of trialkylamino hydroxy organosilicon compounds which are said to have superior hair conditioning properties. U.S. Pat. No. 4,902,499, Bolich et al., issued Feb. 20, 1990, discloses hair care compositions comprising rigid silicone polymers, which are said to give both style retention and conditioning benefits. U.S. Pat. No. 4,906,459, Cobb et al., issued Mar. 6, 1990, discloses hair care compositions comprising a filler reinforced silicone gum, a silicone resin and a volatile carrier, which are said to provide both style retention and conditioning benefits.

Detailed Description Text (14):

One commercially available material which meets these requirements is NATROSOL PLUS Grade 330, a hydrophobically modified hydroxyethylcellulose available from Aqualon Company, Wilmington, Del. This material has a C.sub.16 alkyl substitution of from about 0.5% to about 0.9% by weight. The hydroxyethyl molar substitution for this material is from about 2.8 to about 3.2. The average molecular weight for the water-soluble cellulose prior to modification is approximately 300,000.

Detailed Description Text (125):

The present hair conditioner compositions must be substantially free of water-soluble surfactants. High levels of these materials are not compatible with the vehicle base of the present conditioner compositions. By "substantially free of water-soluble surfactants" is meant that the compositions comprise less than an amount of such surfactants that will destroy the unique desirable rheology that is characteristic of the present compositions. Generally, this will mean that the present compositions comprise no more than about 1%, preferably no more than about 0.5%, of such materials.

- Examples of specific water-soluble surfactants that will have this effect at levels higher than about 1%, include surfactants commonly used at high levels in shampoo compositions. These include alkyl sulfates and ethoxylated alkyl sulfates, such as ammonium lauryl sulfate; amphoteric surfactants which are derivatives of aliphatic secondary and tertiary amines; nonionic surfactants produced by the condensation of alkylene oxide groups with an organic hydrophilic compound, such as laureth-23 (sold under the trade name Brij 35.RTM. by ICI Americas); and high alkyl betaines, sulfo betaines, amido betaines, and amidosulfobetaines, such as cetyl betaine.

[Generate Collection](#)[Print](#)**Search Results** - Record(s) 1 through 2 of 2 returned.

☐ 1. 4904772. 03 Oct 88; 27 Feb 90. Mixed hydrophobe polymers. Sau; Arjun C.. 536/90; 536/91. C08B011/193.

☐ 2. EP 362769 A1. 02 Oct 89. 11 Apr 90. Mixed hydrophobe polymers. SAU, ARJUN CHANDRA. C08B011/193; C08B013/00 C08B015/06 C09D007/00.

[Generate Collection](#)[Print](#)

Term	Documents
MIXED	1110415
MIXEDS	1
HYDROPHOBE	2438
HYDROPHOBES	699
POLYMERS	416988
POLYMER	1363429
((MIXED ADJ HYDROPHOBE) ADJ POLYMERS).USPT,PGPB,JPAB,EPAB,DWPI.	2
(MIXED ADJ HYDROPHOBE ADJ POLYMERS).USPT,PGPB,JPAB,EPAB,DWPI.	2

[Previous Page](#)[Next Page](#)

WEST

Generate Collection

L5: Entry 6 of 6

File: USPT

Apr 20, 1993

DOCUMENT-IDENTIFIER: US 5203768 A
TITLE: Transdermal delivery device

Brief Summary Text (5):

A more recent method of transdermal drug delivery uses electrical current to actively transport agents across a biological surface. This concept is based upon basic principles of electrochemistry and is referred to herein as electrically assisted or iontophoretic delivery. Abramson and Gorin in J. Phys. Chem. 44, pp 1094-1102 (1940) showed that charged ions can be introduced into the skin under the influence of an electric field and that the pathways for transdermal ion transport are hydrophilic pathways in the skin. These hydrophilic pathways include the sweat glands and a hair follicles. Thus, although both passive delivery devices and electrically-assisted delivery devices involve drug delivery through the skin, the transdermal pathways for drugs delivered from passive devices and electrically-assisted devices are quite different.

Detailed Description Text (6):

Electrodes 22 and 23 are electrically conductive and may be formed of a metal, e.g., a metal foil or metal deposited or painted on a suitable backing. Examples of suitable metals include silver, zinc, silver/silver chloride, aluminum, platinum, stainless steel, gold and titanium. Alternatively, the electrodes 22 and 23 may be a formed of a hydrophobic polymer matrix containing a conductive filler such as a metal powder, powdered graphite, carbon fibers or other known electrically conductive filler material. The hydrophobic polymer based electrodes may be made by mixing the conductive filler in the hydrophobic polymer matrix. For example, zinc powder, silver powder, silver/silver chloride powder, powdered carbon, carbon fibers and mixtures thereof can be mixed in a hydrophobic polymer (e.g., a polyisobutylene rubber) matrix, with the preferred amount of conductive filler being within the range of about 30 to 90 vol% and the remainder being the hydrophobic polymer matrix.